

July 2, 1996

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

James Schlichting  
Common Carrier Bureau  
Federal Communications Commission  
1919 M Street, NW, Room 518  
Washington, DC 20554

Dear Jim:

The ESP exemption has fostered the growth of services that has been beneficial for Californians. But, the exemption has also created inequities, such as ESPs effectively paying about 12% of what interexchange carriers pay for comparable interstate switched access services. It has also caused Pacific Bell to incur additional costs to increase network capacity as Pacific has already identified \$13.6 million in central office re-engineering costs for 1996 associated with providing business lines to ESPs. These costs are over and above the normal growth expenditures associated with comparable quantities of business lines provisioned for typical business customers. Yet, Pacific Bell receives no additional revenues from ESPs due to the ESP Exemption.

To more thoroughly document the impact of ESPs using business lines for end-user access, Pacific Bell has been studying the ESP market. A summary of initial results of our study is attached. Pacific Bell will provide additional information to the Commission as it becomes available. We are also ready to meet with you to discuss our study efforts in further detail. If you have any questions or would like to set up a meeting please call me.

Sincerely,



# Pacific Bell ESP Impact Study

## Introduction

To develop information on the size of the ESP market, number of business lines used for end-user access, and the impact on the network Pacific employed a "case study" approach. From study data on a sample set of ESPs, estimates of the size and scope of the ESP market within Pacific's regions were developed. The study design included the measurements of traffic continuously over a 24 hour period for 7 days a week, for a period of two weeks ( May 13 - May 26, 1996). The study encompassed 29 ESPs in 29 Central Offices and over 2000 lines. Initial results are presented below.

## ESP Access Network Topology

The ESP exemption has enabled the ESPs to build access networks using state tariffed business lines. This architecture requires that ESPs establish business lines within the local calling area of their end-users. For example, for an on-line service or Internet access provider to reach 80 to 90% of the end-users in California, they need to establish approximately 50 different business line hunt groups (e.g. local access nodes). Local access nodes vary in size from a few lines up to a 1000 lines in a hunt group associated with a single telephone number. The number of lines, types of service (basic business line, Direct Inward Dialing Trunks, Centrex, and ISDN PRI) vary by type of ESP and the number of end-users in a local calling area.

## ESP Access Network Demographics

Pacific Bell has conducted case studies on a sample of ESPs and has developed the following estimate of the size of ESP access networks in Pacific Bell's market area:

<u>ESP Segment</u>	<u>Entities</u>	<u>Lines in use</u>
Tel messaging	200-250	17,000
On-line/VANS	10-15	50,000
Bulletin Boards	200+	3,000
Internet Access	150+	40,000
Total	560+	110,000

Based on measured call volumes from a sample of ESP lines, the average ESP line handles approximately 125,000 minutes of calls per year. ESPs pay an average of about \$20 per month per access line (including EUCL). Based on 110,000 lines, approximate annual revenues to Pacific Bell paid by ESPs for access is \$26 million. This results in an effective per minute rate for ESPs of just over \$0.002 per minute, or about 12% of what interexchange carriers pay for interstate switched access (an average of \$0.018 per minute).

The On-Line/VAN and Internet segments are growing rapidly, with orders pending for several thousand additional lines. In the past year these segments have grown by up to 20,000 lines. Annualized traffic on Pacific's network from all of the ESP segments is in excess of 13.8 billion minutes.

## Impact of ESP Traffic on Pacific Bell's Network

Lines used by ESPs are priced and engineered based on average traffic levels. Average busy hour traffic levels across all lines at Pacific Bell is 3 to 5 CCS (1 CCS = one-hundred call seconds, or 1.67 minutes of talk time). Central office switches are engineered to handle, on average, the 3 to 5 CCS busy hour load for each line in an office. When busy hour loads exceed the traffic load averages on which switches and trunks are engineered, Pacific Bell has to re-engineer its switches and deploy additional office equipment and trunking. Modularized switches, such as the 5ESS, have switch groups with specific CCS capacities. We typically serve 32 lines from a single switch group in the 5E. However, when an ESP establishes a large multi-line hunt group in an office, we are unable to provision the standard 32 lines on the switch group serving the ESP. We are finding that with some ESP hunt groups we can provision only 4 or 5 lines per switch group. In addition to the impact on switch groups, intraswitch trunking between line and trunk modules must often be increased to handle above average call loads. Plus, in many cases interswitch trunking must be augmented.

Studies of ESP business line hunt groups indicate that ESP busy hours are significantly above those for business lines, with the average busy hour ranging from 13 to 21 CCS. For some individual hunt groups, we observed busy hour approaching 30 CCS. In addition, we identified one office in Silicon Valley where because of a large ESP's presence, 2.5% of the lines contributed to 20-36% of the office's traffic.

<u>ESP Segment</u>	<u>Average Peak Hour CCS</u>	<u>Peak Hour for Segment</u>	<u>Average Call Duration (Min.)</u>
Telemessaging	14	7:00PM	0.6
On Line / VANS	13	10:00PM	10.2
Bulletin Boards	21	11:00PM	28.3
Internet Access *	19	10:00PM	20.8
Average Pacific Bell (for offices sampled)	4	4:00PM	3.8

\* Note: Sample size adjusted for statistical validity

In several instances business and residence customers have experienced slow dial tone and call blocking where ESPs have caused congestion in an office. To alleviate the congestion, office re-engineering jobs must be performed. In the first quarter of this year Pacific expended \$2.6M in incremental capital expense to address ESP network impacts. This requirement is from offices where ESP hunt groups were large enough to be easily identified and linked to congestion problems.

Expenses planned for the remainder of the year include another \$11 million to meet the forecasted ESP demand for ISDN Primary Rate. Thus, 1996 costs identified to date are \$13.6 million. However, we believe this estimate to be conservative in that many network augments are caused by, but not necessarily linked to, ESP traffic loads.

Kenneth Rust  
Director  
Federal Regulatory Matters



July 10, 1996

James Schlichting  
Chief, Competitive Pricing Division  
Federal Communications Commission  
Room 518  
1919 M Street, NW  
Washington, DC 20554

Mr. Schlichting:

This letter is in response to several requests we have had from Common Carrier Bureau staff for information regarding potential traffic capacity problems arising from the ESP exemption. As you know, the ESP exemption was crafted some years ago to aid the fledgling information services industry, and there is increasing concern being expressed that this now robust and rapidly growing market segment will pose a severe capacity problem for a network designed and engineered to accommodate "traditional" traffic patterns. As the data supplied on the attached pages show, calls involving information service providers (ISPs) involve higher occupancy rates and are of much longer duration than traditional traffic.

ISPs gain access to their customer base via dial-up connections purchased from local exchange companies through local service tariffs, instead of purchasing access as other carriers must do. Because of this exemption from the requirement to purchase access, which has traditionally been priced well above cost to provide a subsidy for local service, end users in most cases dial a local telephone number to reach the ISP of their choice. ISPs purchase their local dial tone lines in multi-line hunt groups, and they terminate these lines in analog modem pools. The calls received by the ISP are aggregated, "packetized," and transported using private line facilities to an Internet hub.

NYNEX data for year-end 1995 identified approximately 200 companies using this configuration in its serving area. These companies were managing a minimum of 500 separate locations and utilizing approximately 50,000 business line terminations. NYNEX's current data show that the number of businesses and lines using this configuration is *increasing about 10% per month*.

It is important to note that dial-up connections for this traffic require dedicated links through the switch and network for the duration of the call. As the data on the accompanying pages show, the traffic characteristics of the ISP calls differ significantly from traditional voice traffic, and as a result this incremental demand is already beginning to impact the quality of voice telephone service to some degree, and the rapid expansion of such traffic suggested by the explosive growth in lines portends dire consequences for network access.

NYNEX has been gathering Internet usage data on a regular basis. Attachment #1 provides a representative cross section of five Internet providers of varying size offering service from offices that are predominantly business or residential, or mixed. The data are similar across NYNEX.



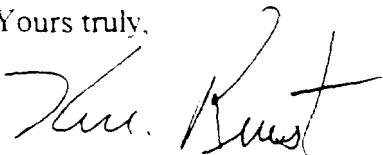
The major success factors for the ISP in this market would appear to be retail price, network accessibility by the end user, and the quality of support offered to the end user by the ISP

The traffic usage data included on the attachments identifies the size of the ISP (# of lines), the ISP's offered price for Internet access, the volume of calls the ISP received (attempts), the number of calls that were blocked (overflow) and the length of time the call to the ISP was connected (holding time). The key factors impacting the telephone network are call volume (attempts), call duration (holding time) and CCS/line, i.e., the number of minutes the lines were in use. Occupancy, or minutes of use, is measured in hundred call seconds (CCS) or seconds of use divided by 3600 for the (1) hour period.

Our analysis of the data identifies holding times of 20 to 40 minutes for this type of traffic, compared to 5 to 10 minutes for voice traffic, and it further shows that *the holding time for the ISP traffic is correlated strongly to price structure*. It should also be noted that these data do not reflect the recent change in consumer pricing from usage sensitive to flat rate now offered by major long distance carriers. Moreover, the CCS or occupancy data indicate that this traffic is *incremental* to normal voice traffic, not complimentary. Occupancy levels in excess of 20 CCS per hour are realized in most cases by 10:00 AM, and this load is sustained throughout the day and evening and beyond midnight. Switches are engineered based upon peak loads occurring at single hours consistent with traditional office load traffic characteristics and call duration.

If you require additional information, or care to discuss the implications of these findings in more detail, please feel free to call me.

Yours truly,

A handwritten signature in dark ink, appearing to read "Kim Rust". The signature is fluid and cursive, with a large, sweeping "K" and a distinct "Rust" at the end.

Attachments

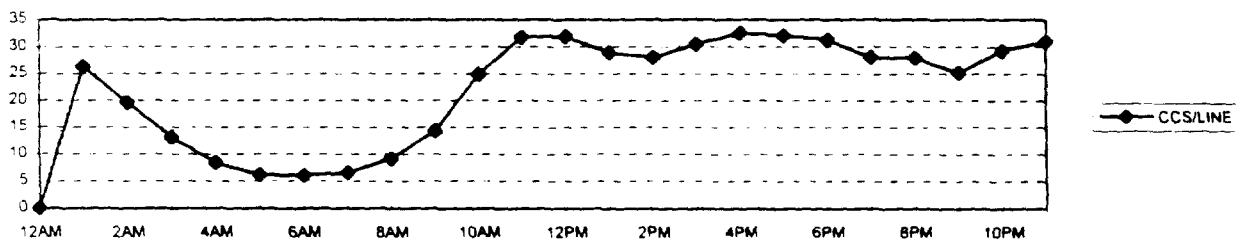
W18th St. 5ESS DS0

Data for Tuesday February 6, 1996

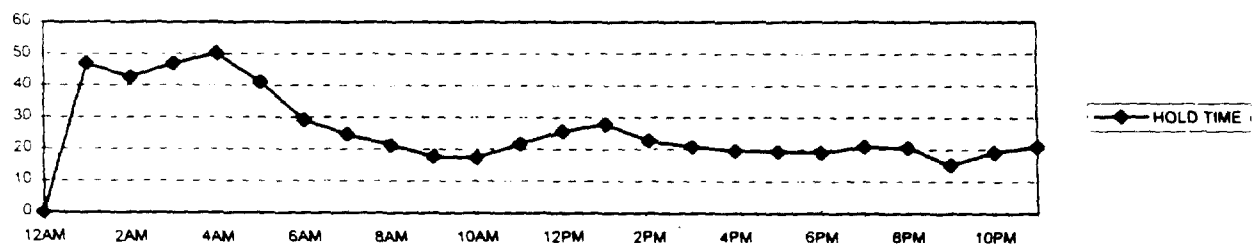
303 Line MLHG (28.8/14.4)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME (min)
12AM	n/a	n/a	n/a	n/a	n/a
1AM	282	0	7.955	26	47
2AM	232	0	5.942	20	43
3AM	142	0	4.009	13	47
4AM	85	0	2.559	8	50
5AM	76	0	1.875	6	41
6AM	105	0	1.841	6	29
7AM	134	0	1.985	7	25
8AM	218	0	2.795	9	21
9AM	411	0	4.344	14	18
10AM	723	0	7.533	25	17
11AM	739	0	9.638	32	22
12PM	629	0	9.677	32	26
1PM	525	0	8.760	29	28
2PM	622	0	8.492	28	23
3PM	735	0	9.236	30	21
4PM	836	0	9.847	32	20
5PM	839	0	9.725	32	19
6PM	835	0	9.489	31	19
7PM	679	0	8.505	28	21
8PM	685	0	8.474	28	21
9PM	836	0	7.629	25	15
10PM	773	0	8.889	29	19
11PM	748	0	9.400	31	21
\$25.00/mo 1st 60 hrs					
<b>Total</b>	<b>11,889</b>	<b>0</b>	<b>158,599</b>	<b>23</b>	<b>22</b>

CCS/LINE



HOLD TIME (min)



Hempstead DMS-100 DS0

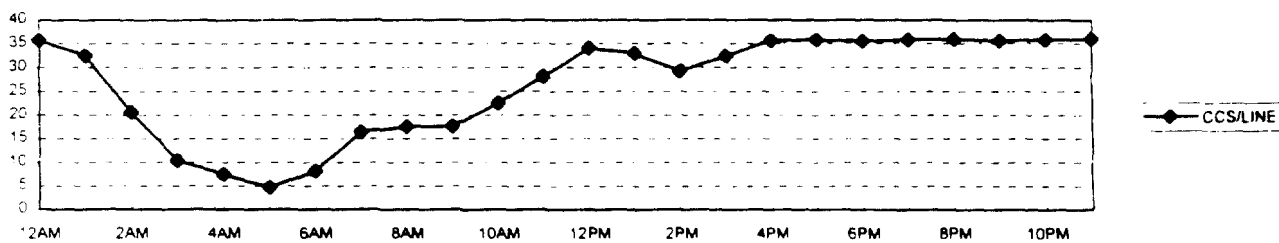
Data for Thursday February 8, 1996

22 Line MLHG

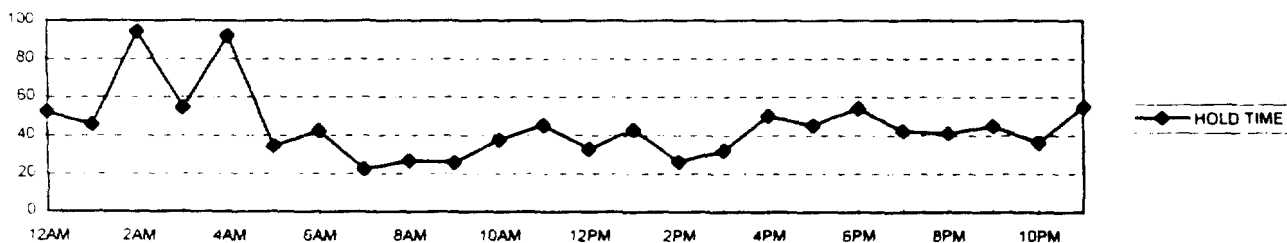
(28.8/14 4/9.6)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME (min)	
12AM	564	539	786	36	52	
1AM	89	63	716	33	46	
2AM	8	0	454	21	95	
3AM	7	0	229	10	55	
4AM	3	0	166	8	92	
5AM	5	0	103	5	34	
6AM	7	0	179	8	43	
7AM	27	0	363	17	22	
8AM	24	0	386	18	27	
9AM	25	0	388	18	26	
10AM	22	0	497	23	38	
11AM	112	73	618	28	45	
12PM	158	120	749	34	33	
1PM	102	74	724	33	43	
2PM	59	18	643	29	26	
3PM	87	50	712	32	32	
4PM	179	153	784	36	50	
5PM	461	432	789	36	45	
6PM	254	230	781	36	54	
7PM	896	865	789	36	42	
8PM	714	682	790	36	41	
9PM	471	442	784	36	45	\$9.95/mo 1st 5 hrs
10PM	508	472	788	36	36	(each addit hr \$2.50)
11PM	573	549	791	36	55	\$19.95/mo unlimited hrs
<b>Total</b>	<b>5,355</b>	<b>4,762</b>	<b>14,009</b>	<b>27</b>	<b>39</b>	

CCS/LINE



HOLD TIME (min)



W18th St. 5ESS DS0

Data for Friday, February 16, 1996

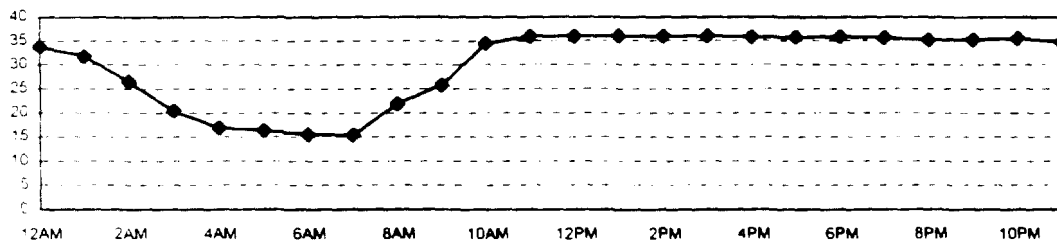
110 Line MLHG (28.8)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME (min)
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12AM	238	0	3,714	34	26
1AM	144	0	3,493	32	40
2AM	71	0	2,915	27	68
3AM	40	0	2,244	20	94
4AM	56	0	1,861	17	55
5AM	27	0	1,802	16	111
6AM	30	0	1,710	16	95
7AM	49	0	1,694	15	58
8AM	107	0	2,404	22	37
9AM	126	0	2,834	26	37
10AM	703	452	3,785	34	44
11AM	1,682	1,117	3,949	36	39
12PM	1,690	1,292	3,955	36	68
1PM	1,708	1,273	3,958	36	80
2PM	979	635	3,954	36	45
3PM	1,173	805	3,958	36	53
4PM	1,242	912	3,938	36	42
5PM	554	341	3,930	36	45
6PM	1,189	821	3,948	36	42
7PM	858	517	3,919	36	28
8PM	345	158	3,873	35	41
9PM	347	164	3,877	35	42
10PM	314	165	3,904	35	58
11PM	215	64	3,815	35	45
<b>Total</b>	<b>13,887</b>	<b>8,716</b>	<b>79,434</b>	<b>30</b>	<b>44</b>

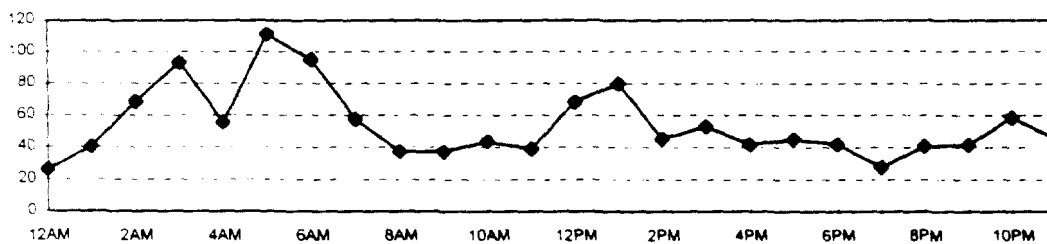
\$10.00/mo unlim hrs

CCS/LINE



CCS/LINE

HOLD TIME (min)



HOLD TIME



Hempstead DMS-100 DS0

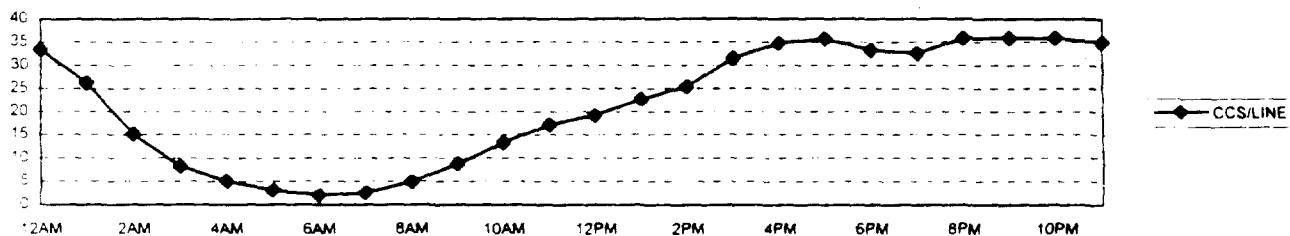
Data for Sunday March 3, 1996

632 Line MLHG

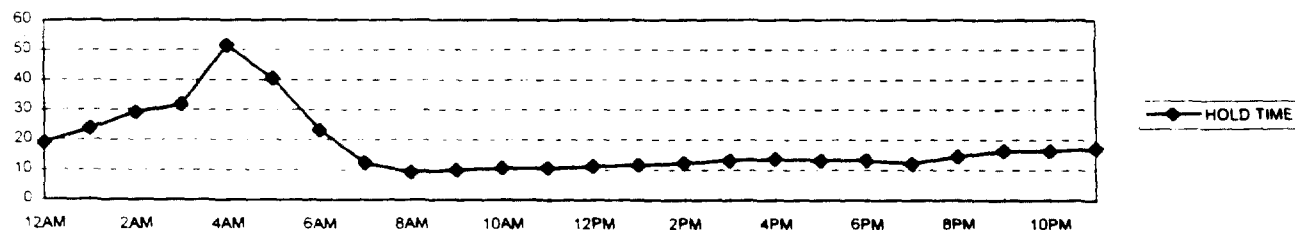
(14 4/9.6)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME (min)	
12AM	1,884	36	21,151	33	19	
1AM	1,165	0	16,590	26	24	
2AM	547	0	9,570	15	29	
3AM	274	0	5,220	8	32	
4AM	103	0	3,193	5	52	
5AM	79	0	1,918	3	40	
6AM	94	0	1,313	2	23	
7AM	219	0	1,626	3	12	
8AM	560	0	3,103	5	9	
9AM	926	0	5,574	9	10	
10AM	1,314	0	8,397	13	11	
11AM	1,699	0	10,823	17	11	
12PM	1,812	0	12,144	19	11	
1PM	2,050	0	14,325	23	12	
2PM	2,191	0	16,096	25	12	
3PM	2,534	0	19,928	32	13	
4PM	2,859	180	21,983	35	14	
5PM	3,764	915	22,561	36	13	
6PM	2,839	185	21,046	33	13	
7PM	2,902	71	20,610	33	12	
8PM	5,621	3,019	22,641	36	15	
9PM	8,210	5,909	22,701	36	16	
10PM	7,251	4,931	22,714	36	16	\$9.95/mo 1st 5 hrs
11PM	3,807	1,662	22,076	35	17	(each addit hr \$2.95)
<b>Total</b>	<b>54,704</b>	<b>16,908</b>	<b>327,303</b>	<b>22</b>	<b>14</b>	

CCS/LINE



HOLD TIME (min)



West St DMS-100 DS0

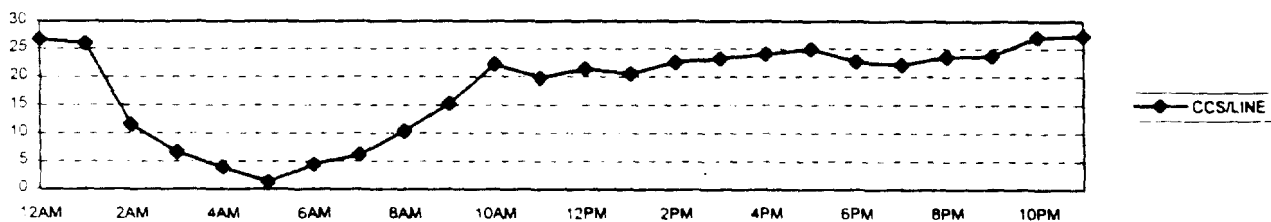
Data for Monday April 22, 1996

191 Line MLHG

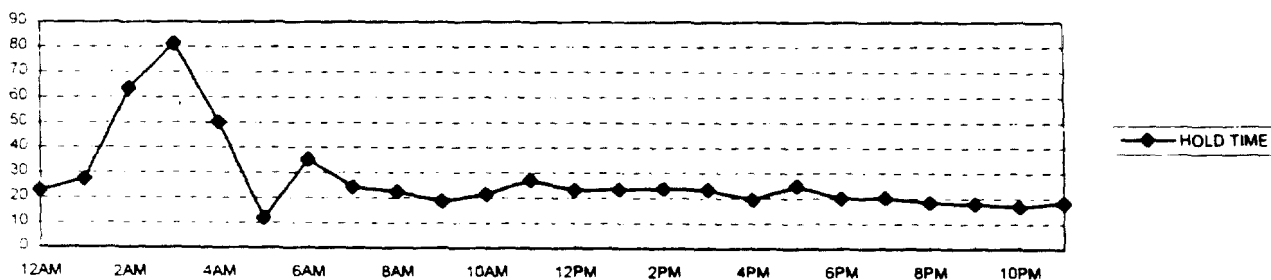
(28.8/14.4/9.6)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME (min)	
12AM	376	3	5,100	27	23	
1AM	302	0	4,973	26	27	
2AM	58	0	2,211	12	64	
3AM	26	0	1,270	7	81	
4AM	25	0	754	4	50	
5AM	35	0	251	1	12	
6AM	40	0	847	4	35	
7AM	81	0	1,181	6	24	
8AM	147	0	1,985	10	23	
9AM	260	0	2,910	15	19	
10AM	330	0	4,247	22	21	
11AM	233	0	3,789	20	27	
12PM	295	0	4,091	21	23	
1PM	278	0	3,930	21	24	
2PM	303	0	4,320	23	24	
3PM	315	0	4,436	23	23	
4PM	393	0	4,586	24	19	
5PM	318	0	4,771	25	25	
6PM	360	0	4,337	23	20	
7PM	348	0	4,230	22	20	
8PM	408	0	4,501	24	18	
9PM	420	0	4,530	24	18	\$9.95/mo 1st 5 hrs
10PM	511	0	5,174	27	17	(each addit hr \$2.50)
11PM	510	36	5,203	27	18	\$19.95/mo unlimited hrs
<b>Total</b>	<b>6,372</b>	<b>39</b>	<b>83,627</b>	<b>19</b>	<b>22</b>	

CCS/LINE



HOLD TIME



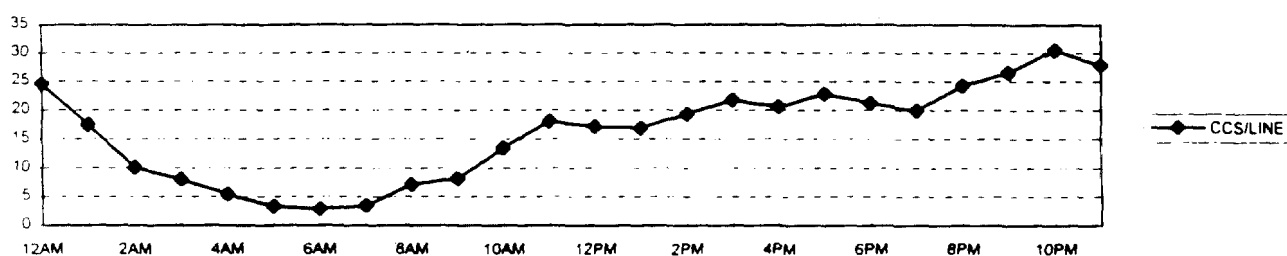
GRCYNYGCD50 5ESS DS0

Data for Monday February 19, 1996

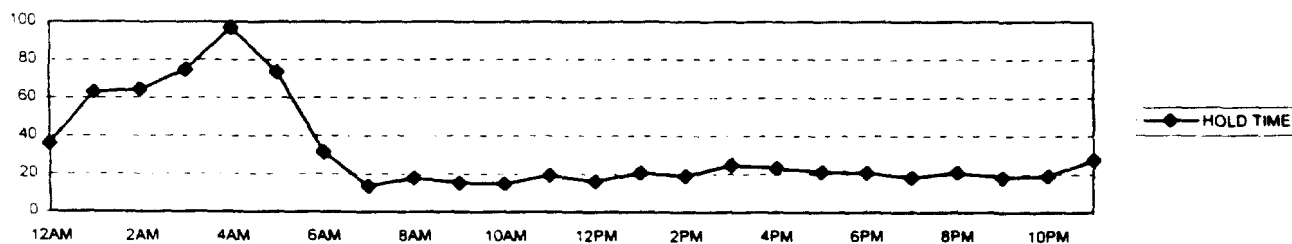
201 Line MLHG (14 4)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME	
12AM	228	0	4.920	24	36	
1AM	93	0	3.520	18	63	
2AM	53	0	2.047	10	64	
3AM	36	0	1.618	8	75	
4AM	19	0	1.103	5	97	
5AM	15	0	663	3	74	
6AM	30	0	571	3	32	
7AM	85	0	697	3	14	
8AM	133	0	1,430	7	18	
9AM	177	0	1,636	8	15	
10AM	304	0	2,713	13	15	
11AM	309	0	3,621	18	20	
12PM	353	0	3,457	17	16	
1PM	272	0	3,402	17	21	
2PM	337	0	3,886	19	19	
3PM	291	0	4,370	22	25	
4PM	293	0	4,129	21	23	
5PM	357	0	4,587	23	21	
6PM	341	0	4,266	21	21	\$9.95/mo 1st 5 hrs
7PM	361	0	4,002	20	18	(each addit hr \$2.95)
8PM	386	0	4,880	24	21	\$14.99/mo 1st 15 hrs
9PM	481	0	5,335	27	18	(each addit hr \$2.95)
10PM	530	0	6,137	31	19	\$29.99/mo 1st 30 hrs
11PM	337	0	5,606	28	28	(each addit hr \$2.95)
<b>Total</b>	<b>5,821</b>	<b>0</b>	<b>78,596</b>	<b>16</b>	<b>23</b>	

CCS/LINE



HOLD TIME (min)



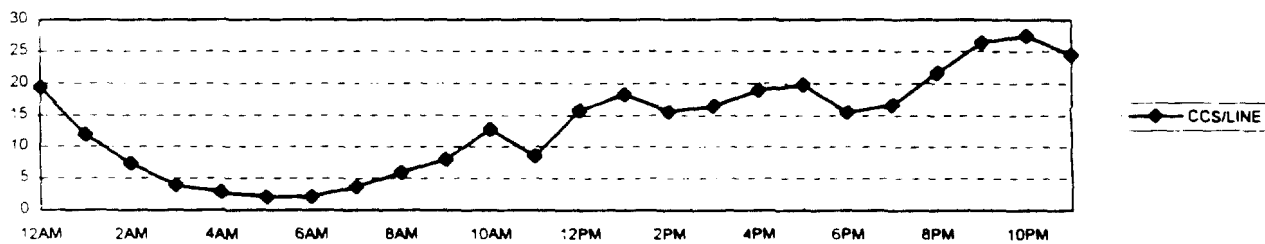
White PlainsDMS-100 DS0

Data for Tuesday February 20, 1996

128 Line MLHG (14.4)

HOURS	CALL ATTEMPTS	OVERFLOW	USAGE	CCS/LINE	HOLD TIME (min)	
12AM	102	0	2,482	19	41	
1AM	45	0	1,521	12	56	
2AM	28	0	944	7	56	
3AM	8	0	492	4	103	
4AM	6	0	364	3	101	
5AM	8	0	264	2	55	
6AM	20	0	269	2	22	
7AM	53	0	465	4	15	
8AM	93	0	758	6	14	
9AM	126	0	1,023	8	14	
10AM	195	0	1,631	13	14	
11AM	204	0	1,085	8	9	
12PM	212	0	2,013	16	16	
1PM	191	0	2,345	18	20	
2PM	182	0	1,995	16	18	
3PM	200	0	2,105	16	18	
4PM	250	0	2,427	19	16	
5PM	269	0	2,534	20	16	
6PM	172	0	1,983	15	19	\$9.95/mo 1st 5 hrs
7PM	214	0	2,132	17	17	(each addit hr \$2.95)
8PM	264	0	2,771	22	17	\$14.99/mo 1st 15 hrs
9PM	247	0	3,382	26	23	(each addit hr \$2.95)
10PM	240	0	3,524	28	24	\$29.99/mo 1st 30 hrs
11PM	206	0	3,132	24	25	(each addit hr \$2.95)
<b>Total</b>	<b>3,535</b>	<b>0</b>	<b>41,641</b>	<b>14</b>	<b>20</b>	

CCS/LINE



HOLD TIME (min)

